ROUSH

THE ART OF PERFORMANCE ENGINEERING™

Conversion of Light- and Medium-Duty Vehicles to Operate on Liquid Propane Injection

2007 ½ -2008
Ford F-150

2009 – 2010
Ford F-250 & F-350

2009 – 2011
Ford E-150 & E-250

Ferrario Ford
ROUSH Liquid Propane Installation Center
2472 Corning Road
Elmira, NY 14903
607-734-1681
www.drivepropane.com

Company Overview

ROUSH Performance Profile:

ROUSH is a leading supplier of automotive engineering, development and manufacturing services. From design through prototyping, testing and manufacturing, ROUSH has the capabilities to take visions from the sketch pad to the showroom floor. ROUSH is a Tier-1 supplier of automotive manufacturing solutions. Core competencies include design, engineering, manufacturing, building and marketing performance vehicles, crate engines, vehicle components and alternative energy solutions.

ROUSH is a privately held corporation based in Livonia, Michigan with a worldwide footprint. Founded in 1976, ROUSH employs over 2,000 people in more than 50 locations throughout North America.

Ferrario Ford Profile:

Ferrario Ford is part of the Ferrario Auto Team, which has been in business for 40 years. Ferrario operates Dealerships for Ford, GM, and Chrysler, with three locations in Towanda, PA, and Elmira, NY. Ferrario is the recipient of multiple manufacturer awards, including Ford Blue Oval, GM Mark of Excellence, and Chrysler Five Star. Unlike many other Auto Dealers, Ferrario recently celebrated its best year ever, in 2008.

Ferrario Ford is a leading Dealer for ROUSH Performance, including the ROUSH Performance Mustangs. Ferrario is one of several ROUSH Liquid Propane Injection System authorized installation centers, nationwide.

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Description of the Proposed System

Propane is currently the world's third most common engine fuel, besides gasoline and diesel. It powers over 10 million vehicles worldwide, and plays an important role in reducing the impact motor vehicles have on the environment. Propane occurs naturally during oil refining and natural gas processing. Approximately 90% of U.S. propane requirements are met through domestic production, with an additional 7% coming from Canadian production, making it one of the most stable and reliable sources of energy.

With over 12,500 private and public fueling stations in place today, and more opening daily, it truly is 'the alternative fuel that's already here.'

ROUSH offers a system that completely converts gasoline powered vehicles to run Liquid Propane Injection. The first system fits 2007 ½ - 2008 Ford F-150 truck with the 5.4L engine. The second system fits 2009 – 2010 Model Year Ford F-250 and F-350 trucks, also equipped with the 5.4L engine. ROUSH is currently in development on a system for the 2009 – 2011 E-150 and E-250 equipped with the 4.6L engine, which should be available in Q1, 2010.

1. Environmental Protection Agency (EPA) Certificate of Conformity

The ROUSH 2007 ½ - 2008 Ford F-150 LPI Conversion Kit was EPA approved in May, 2008.

ROUSH Performance is currently going through the required processes to have the ROUSH 2009 – 2010 Ford F-250 & F-350 LPI Conversion kit approved by the EPA.

ROUSH has a robust understanding of the processes required to have their Liquid Propane Injection conversion kit technology approved and certified by the EPA, and is confident that it will meet all necessary EPA requirements on the 2009 – 2010 Ford F-250 & F-350 LPI conversion kit, and receive all necessary documents attesting to such, by July of 2009.

2. California Air Resources Board (CARB) Approval

ROUSH has received a verbal commitment from CARB that all requirements for the ROUSH 2007 ½ - 2008 Ford F-150 LPI Conversion Kit have been met in February, 2008.

The ROUSH 2009 – 2010 Ford F-250 & F-350 LPI Conversion Kit is expected to be approved by CARB in September, 2009, one month after it is released for sale.

3. Complete System Conversion Details

The ROUSH LPI system was developed with a number of key objectives in mind around operation, serviceability and safety.

ROUSH wanted their propane powered trucks to have the same operational "feel" as the gasoline-powered original, and made a number of engineering decisions around that core focus. Through calibration, ROUSH was able to achieve the same horsepower, torque and towing capacity figures as the gasoline powered equivalents, typically the three most important figures when considering a light- or medium-duty work truck.

Serviceability was another important factor, and all systems were intended to be "plug-and-play." Through a close relationship with the Ford dealership network and a detailed understanding of their operational procedures, ROUSH developed the kit to allow for any Ford dealer to utilize their existing diagnostic tools to identify any issues. A ROUSH Propane powered F-150, F-250, or F-350 can be taken to any Ford dealership in the country for normal maintenance and service, or to diagnose a warranty concern. The highlight of the system is in the quality engineering, not in a fancy installation.

Safety was also a major consideration in the development of the kit. Through rigorous testing, product development, and engineering, the kit meets all requirements for certification with NHTSA, NFPA, ASME, CAN, CSA, EPA, and CARB.

The ROUSH F-150, F-250, and F-350 LPI Conversion Kits consist of the following components:

- Propane fuel tank with multi-valve check valve
- Billet aluminum fuel rail
- High pressure fuel injectors
- Fuel lines
- Air inlet system
- Wiring
- ROUSH PCM calibration
- Labeling and badging

The minimum order size is one (1) unit. The total turn-around time, from order to delivery, depends on the number of conversion kits ordered and whether or not ROUSH has received the Certificate of Conformity from the EPA, and the Executive Order (EO) number from CARB if ordering in a 'green' state, at the time of order.

ROUSH and Ferrario are capable of scaling their operation to meet any production request.

4. Alternative Fuel Conversion System Technology

The ROUSH LPI (Liquid Propane Injection) system consists of Sequential Port Fuel Injection, which is different than previous light duty propane vehicle systems.

All previous light duty propane vehicle systems used propane in vapor form. Vapor systems are subject to cold starting problems, reduced engine performance, and driveability issues, primarily due to changes in propane vapor density at various temperatures. No propane vapor based system has ever achieved CARB certification. Such systems required mechanical knowledge on the part of the user.

By contrast, the ROUSH LPI system requires no compromises from the user. Other than a 4 second starting delay, for system pressurization, there is no operational difference between the ROUSH LPI system, and the original gasoline system it replaces. Horsepower, torque, and towing capability are unchanged. Most drivers say the ROUSH LPI equipped vehicle actually runs smoother.

5. Other Alternative Fuel System Products from ROUSH Enterprises

ROUSH considers Propane-powered vehicles to be the primary focus of their alternative-fuel vehicle development activities. However, ROUSH has been involved in a number of other engineering and development projects around alternative fuel vehicles:

ROUSH Electric Vehicle (REV)
A compact, front-wheel drive pickup truck developed for limited mileage environments - ranging from campuses and parks to self-contained communities and large commercial developments.

Hydrogen-Powered GM Pickup Truck
ROUSH provided powertrain and electronic control system support to develop and build a fleet of 10 vehicles with hydrogen-fueled internal combustion engines.

Diesel ATV
ROUSH, in conjunction with Arctic Cat, successfully integrated diesel powertrain technology into an existing gasoline-powered ATV for military applications.

Ford Escape Hybrid
ROUSH provided a variety of development support services, including packaging/CAD, prototype builds and fleet testing for Ford's popular Ford Escape Hybrid vehicle.

World's Fastest Fuel Cell Vehicle
ROUSH worked with Ford's Fuel Cell Development Group to design and build a fuel cell-powered Ford Fusion that achieved over 200 mph, and the title of 'fastest fuel cell car', at the Bonneville Salt Flats in Utah.

Battery Development
ROUSH is currently working with two major suppliers of lithium-ion batteries to assist with packaging their cell technologies into a variety of vehicle platforms.

Noise, Vibration & Harshness (NVH) Improvements
ROUSH has worked on a number of projects related to fuel cell, hybrid and dedicated-electric vehicles in an effort to improve NVH quality. These include improving overall vehicle NVH, as well as improving NVH on specific components in the vehicles, such as:

- Hybrid transmissions
- Electric power steering pumps
- Electric A/C compressors
- Electric brake vacuum pumps
- Electric motor power plants
- Fuel cell cooling pumps & fans
- Various acoustic and vibration studies

Emissions Testing
Extensive emissions testing has taken place at ROUSH facilities for a number of major vehicle and powertrain manufacturers engaged in alternative fuel technologies. Fuel types tested include propane, natural gas and hydrogen.

ROUSH has always worked very closely with the EPA, and one of the main design challenges from the beginning was to offer an EPA-certified kit to our customers. The 2007 ½ - 2008 F-150 Liquid Propane Injection conversion kit was certified by the EPA in May of 2008. The 2009 – 2010 F-250 & F-350 Liquid Propane Injection conversion kit is scheduled to be certified in July of 2009.

6. Fuel Capacity / Range Figures & Options

F-250 & F-350 Conversion Kits
ROUSH has developed two fuel tank options for the new 2009 – 2010 Ford F-250 and F-350 conversion kit; an in-bed extended range fuel tank, and an under-bed tank.

In-Bed Tank
The In-Bed tank option is all about range. The larger tank, positioned in the front of the truck bed where it meets the back of the cab, gives the Propane-powered F-250 or F-350 a longer range of operation between fill-ups. This tank option will be available beginning with Job 1 in August, 2009.

This tank will give an approximate range of 450 miles

Under-Bed Tank
In September, 2009, ROUSH will begin offering an under-bed tank option that will open up the available cargo space in the bed of the truck. While the distance between fill ups is not as far as the in-bed tank, it does achieve similar range figures as compared to the gasoline equivalent.

This tank will give an approximate range of 250 miles

F-150 Conversion Kits
ROUSH has two fuel tank options for the 2007 ½ – 2008 Ford F-150 conversion kit as well, but the installation options differ:

In-Bed Tank
The larger in-bed tank is positioned in the front of the truck bed where it meets the back of the cab. This tank is available as a ROUSH-installed tank, or can be purchased and installed right at a Ford dealership or authorized upfitter.

This tank will give an approximate range of 500 miles

Under-Bed (Toroidal) Tank
The F-150 under-bed tank fits in the area where the spare tire is held, under the truck bed. The smaller under-bed tank option is only available if trucks are sent to ROUSH for installation.

This tank will give an approximate range of 250 miles

E-150 & E-250 Conversion Kits
ROUSH plans to offer one fuel tank option for the 2009 – 2011 Ford E-150 & E-250:

Under-Bed Tank
This tank will be available as a ROUSH-installed system, or can be purchased and installed right at a Ford dealership or authorized upfitter.

This tank is estimated to give an approximate range of 250 miles

7. Warranty Details

ROUSH stands behind the engineering work that goes into all of their products, and the 2007 ½ - 2008 Ford F-150 LPI and 2009 – 2010 Ford F-250 & F-350 LPI Conversion Kits are no exception.

Ford will continue to honor the factory warranty on any components that remain in place and untouched by ROUSH after the conversion is complete.

ROUSH will honor a 3 year / 36,000 mile warranty on all of the components that are installed or modified as a part of the LPI conversion kit.

8. Repair & Service "After the Sale"

ROUSH has worked hard to make servicing all of its products as seamless as possible for before, during, and after the warranty period. ROUSH is widely considered to have one of the finest customer service and warranty divisions in the industry, and they will be available to handle any and all requests in a timely fashion.

One of the most convenient aspects of the relationship ROUSH has with Ford is that a Ford F-150, F-250, or F-350 equipped with the ROUSH LPI system can be taken to any Ford dealership in the country for service.

9. Training

Detailed installation instructions will be sent to anyone who requests them, which will give the mechanics a better understanding of what parts have been replaced, where they are located, and what they do.

If at any time a repair center happens to have an issue or concern, ROUSH has a dedicated customer service line open and available from 7 am – 7 pm, Monday through Friday, and from 10 am – 2 pm on Saturday.

10. Replacement Part Availability

ROUSH is dedicated to customer satisfaction, especially after the warranty period on our products has expired. We commit to having replacement parts available for up to 7 years after the sale.

If your fleet requires replacement part availability to be extended, please advise and ROUSH will make all the necessary arrangements to comply.

11. Types of Vehicles / Benefits

ROUSH currently offers Propane conversion kits for two different vehicle models:

- 2007 ½ - 2008 model year Ford F-150 equipped with the 5.4L V8 engine
- 2009 – 2010 model year Ford F-250 & F-350 equipped with the 5.4L V8 engine

With each conversion, customers have seen a 'cost per mile' benefit range anywhere from $0.01 to $0.07 / mile.

With much lower emission quantities of greenhouse gases, carbon monoxide, nitrous oxide, and particulates, the LPI kit also contributes a much smaller environmental 'footprint' through reduced emissions.

The minimum number of conversions to start seeing a benefit is one (1) unit.